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Smart Sight: a tourist assistant system

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Abstract

In this paper, we present our efforts towards developing an intelligent tourist system. Th with a unique combination of sensors and software. The hardware includes two computi lapel microphone plus an earphone, a video camera and a head-mounted display. This multimodal interface to take advantage of speech and gesture input to provide assistant software supports natural language processing, speech recognition, machine translation recognition and multimodal fusion. A vision module is trained to locate and read written adapt to to new environments, and is able to interpret intentions offered by the user suc clarification or pointing gesture. We illustrate the applications of the system using two ex

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Author Keywords

Not Available

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Citing Documents

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Pervasive Computing, IEEE
On page(s): 72- 79, Volume: 2, Issue: 2, April-June 2003
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Image Processing, IEEE Transactions on
On page(s): 87- 99, Volume: 13, Issue: 1, Jan. 2004
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1 [Posters & demos: An automatic sign recognition and translation system](#)



Jie Yang, Jlang Gao, Ying Zhang, Xilin Chen, Alex Waibel

 November 2001 **Proceedings of the 2001 workshop on Perceptive user interfaces PUI '01**

Publisher: ACM Press

Full text available: pdf(1.21 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#)

A sign is something that suggests the presence of a fact, condition, or quality. Signs are everywhere in our lives. They make our lives easier when we are familiar with them. But sometimes they pose problems. For example, a tourist might not be able to understand signs in a foreign country. This paper discusses problems of automatic sign recognition and translation. We present a system capable of capturing images, detecting and recognizing signs, and translating them into a target language. We d ...

Keywords: perceptive user interface, sign detection, sign translation, vision-based interface

2 [Pattern recognition and synthesis for sign language translation system](#)



M. Ohki, H. Sagawa, T. Sakiyama, E. Oohira, H. Ikeda, H. Fujisawa

 October 1994 **Proceedings of the first annual ACM conference on Assistive technologies Assets '94**

Publisher: ACM Press

Full text available: pdf(721.82 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Sign language is one means of communication for hearing-impaired people. Words and sentences in sign language are mainly represented by hands' gestures. In this report, we show a sign language translation system which we are developing. The system translates Japanese sign language into Japanese and vice versa. In this system, hand shape and position data are inputted using DataGlove. Inputted hand motions are recognized and translated into Japanese sentences. Japanese text is translated into ...

3 [Towards automatic sign translation](#)

Jie Yang, Jlang Gao, Ying Zhang, Alex Waibel

 March 2001 **Proceedings of the first international conference on Human language technology research HLT '01**

Publisher: Association for Computational Linguistics

Full text available:  [pdf\(208.10 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Signs are everywhere in our lives. They make our lives easier when we are familiar with them. But sometimes they also pose problems. For example, a tourist might not be able to understand signs in a foreign country. In this paper, we present our efforts towards automatic sign translation. We discuss methods for automatic sign detection. We describe sign translation using example based machine translation technology. We use a user-centered approach in developing an automatic sign translation syst ...

Keywords: sign, sign detection, sign recognition, sign translation

4 Description and recognition methods for sign language based on gesture components



Hirohiko Sagawa, Masaru Takeuchi, Masaru Ohki

January 1997 **Proceedings of the 2nd international conference on Intelligent user interfaces IUI '97**

Publisher: ACM Press

Full text available:  [pdf\(732.86 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: chereme, gesture description, pattern recognition, sign language

5 Transfer-based statistical translation of Taiwanese sign language using PCFG



Chung-Hsien Wu, Hung-Yu Su, Yu-Hsien Chiu, Chia-Hung Lin

April 2007 **ACM Transactions on Asian Language Information Processing (TALIP)**, Volume 6 Issue 1

Publisher: ACM Press

Full text available:  [pdf\(581.09 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article presents a transfer-based statistical model for Chinese to Taiwanese sign-language (TSL) translation. Two sets of probabilistic context-free grammars (PCFGs) are derived from a Chinese Treebank and a bilingual parallel corpus. In this approach, a three-stage translation model is proposed. First, the input Chinese sentence is parsed into possible phrase structure trees (PSTs) based on the Chinese PCFGs. Second, the Chinese PSTs are then transferred into TSL PSTs according to the t ...

Keywords: Taiwanese sign language

6 Posters: Gesture-driven American sign language phraselator



Jose L. Hernandez-Rebollar

October 2005 **Proceedings of the 7th international conference on Multimodal interfaces ICMI '05**

Publisher: ACM Press

Full text available:  [pdf\(306.63 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper describes a portable American Sign Language (ASL)-to-English phraselator. This wearable device is based on an Acceleglove originally developed for recognizing the hand alphabet, and a two-link arm skeleton that detects hand location and movement with respect to the body. Therefore, this phraselator is able to recognize finger-spelled words as well as hand gestures and translate them into spoken voice through a speech synthesizer. To speed-up the recognition process, a simple predictio ...

Keywords: ASL translation, gestural interfaces, gesture recognition

7 Design challenges: American sign language recognition in game development for deaf children



Helene Brashear, Valerie Henderson, Kwang-Hyun Park, Harley Hamilton, Seungyon Lee, Thad Starner

October 2006 **Proceedings of the 8th international ACM SIGACCESS conference on Computers and accessibility Assets '06**

Publisher: ACM Press

Full text available: pdf(341.40 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

CopyCat is an American Sign Language (ASL) game, which uses gesture recognition technology to help young deaf children practice ASL skills. We describe a brief history of the game, an overview of recent user studies, and the results of recent work on the problem of continuous, user-independent sign language recognition in classroom settings. Our database of signing samples was collected from user studies of deaf children playing a Wizard of Oz version of the game at the Atlanta Area School for th ...

Keywords: ASL, game; recognition, sign language

8 Session 5: novel interaction: A teaching system of Japanese sign language using sign language recognition and generation



Hirohiko Sagawa, Masaru Takeuchi

December 2002 **Proceedings of the tenth ACM international conference on Multimedia MULTIMEDIA '02**

Publisher: ACM Press

Full text available: pdf(312.40 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In recent years, the number of sign language learners is increasing in Japan. And there are many teaching materials of sign language such as textbooks, videotapes and software for PCs. However, these teaching materials have several problems that learners cannot study sign language sufficiently because the learners can mainly study manual gestures, cannot change the direction to see signed gestures, and cannot check their signed gestures by themselves. We developed a sign language teaching system ...

Keywords: 3DCG animation and teaching system, recognition, sign language

9 A gesture recognition architecture for sign language



Annelies Braffort

April 1996 **Proceedings of the second annual ACM conference on Assistive technologies Assets '96**

Publisher: ACM Press

Full text available: pdf(729.70 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: data glove, gesture interpretation, gesture recognition, sign language

10 Development of an information kiosk with a sign language recognition system



Hirohiko Sagawa, Masaru Takeuchi

November 2000 **Proceedings on the 2000 conference on Universal Usability CUU '00**

Publisher: ACM Press

Full text available: pdf(471.06 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

terms

An information kiosk with a JSL (Japanese sign language) recognition system that allows hearing-impaired people to easily search for various kinds of information and services was tested in a government office. This kiosk system was favorably received by most users.

Keywords: hearing impaired, information kiosk, recognition, sign language

11 A unified approach in speech-to-speech translation: integrating features of speech recognition and machine translation

Ruiqiang Zhang, Genichiro Kikui, Hirofumi Yamamoto, Taro Watanabe, Frank Soong, Wai Kit Lo


August 2004 **Proceedings of the 20th international conference on Computational Linguistics COLING '04**

Publisher: Association for Computational Linguistics

Full text available:  [pdf\(128.32 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Based upon a statistically trained speech translation system, in this study, we try to combine distinctive features derived from the two modules: speech recognition and statistical machine translation, in a loglinear model. The translation hypotheses are then rescored and translation performance is improved. The standard translation evaluation metrics, including BLEU, NIST, multiple reference word error rate and its position independent counterpart, were optimized to solve the weights of the fea ...

12 Development of an American Sign Language game for deaf children

 Valerie Henderson, Seungyon Lee, Helene Brashear, Harley Hamilton, Thad Starner, Steven Hamilton

June 2005 **Proceeding of the 2005 conference on Interaction design and children IDC '05**


Publisher: ACM Press

Full text available:  [pdf\(478.87 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present a design for an interactive American Sign Language game geared for language development for deaf children. In addition to work on game design, we show how Wizard of Oz techniques can be used to facilitate our work on ASL recognition. We report on two Wizard of Oz studies which demonstrate our technique and maximize our iterative design process. We also detail specific implications to the design raised from working with deaf children and possible solutions.

Keywords: ASL, Wizard of Oz method, children, computer games, deaf, gesture recognition, language acquisition

13 Communication technologies: Tessa, a system to aid communication with deaf people

 Stephen Cox, Michael Lincoln, Judy Tryggvason, Melanie Nakisa, Mark Wells, Marcus Tutt, Sanja Abbott

July 2002 **Proceedings of the fifth international ACM conference on Assistive technologies Assets '02**

Publisher: ACM Press

Full text available:  [pdf\(833.57 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

TESSA is an experimental system that aims to aid transactions between a deaf person and a clerk in a Post Office by translating the clerk's speech to sign language. A speech

recogniser recognises speech from the clerk and the system then synthesizes the appropriate sequence of signs in British Sign language (BSL) using a specially-developed avatar. By using a phrase lookup approach to language translation, which is appropriate for the highly constrained discourse in a Post Office, we were able to ...


Keywords: Aids for the Deaf, avatars, interactive systems, speech recognition, translation systems

14 The VI framework program in Europe: some thoughts about speech to speech translation research

Gianni Lazzari

July 2002 **Proceedings of the ACL-02 workshop on Speech-to-speech translation: algorithms and systems - Volume 7**

Publisher: Association for Computational Linguistics

Full text available:  pdf(175.47 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)


Significant progress has been made in the field of human language technologies. Various tasks like continuous speech recognition for large vocabulary, speaker and language identification, spoken information inquiry, information extraction and cross-language retrieval in restricted domains are today feasible and different prototypes and systems are running. The spoken translation problem on the other hand is still a significant challenge: "Good text translation was hard enough to pull off. Speech ...

15 Project notes and demos: MT and topic-based techniques to enhance speech recognition systems for professional translators

Yevgeny Ludovik, Ron Zacharski

July 2000 **Proceedings of the 18th conference on Computational linguistics - Volume 2**

Publisher: Association for Computational Linguistics

Full text available:  pdf(387.69 KB) Additional Information: [full citation](#), [abstract](#), [references](#)



Our principle objective was to reduce the error rate of speech recognition systems used by professional translators. Our work concentrated on Spanish-to-English translation. In a baseline study we estimated the error rate of an off-the-shelf recognizer to be 9.98%. In this paper we describe two independent methods of improving speech recognizers: a machine translation (MT) method and a topic-based one. An evaluation of the MT method suggests that the vocabulary used for recognition cannot be com ...

16 Splitting long or ill-formed input for robust spoken-language translation

Osamu Furuse, Setsuo Yamada, Kazuhide Yamamoto

August 1998 **Proceedings of the 36th annual meeting on Association for Computational Linguistics - Volume 1 , Proceedings of the 17th international conference on Computational linguistics - Volume 1**

Publisher: Association for Computational Linguistics

Full text available:  pdf(639.58 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)
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This paper proposes an input-splitting method for translating spoken-language which includes many long or ill-formed expressions. The proposed method splits input into well-balanced translation units based on a semantic distance calculation. The splitting is performed during left-to-right parsing, and does not degrade translation efficiency. The complete translation result is formed by concatenating the partial translation results of each split unit. The proposed method can be incorporated into ...

17 Measuring similarity between transliterations against noise data

- ◆ Chung-Chian Hsu, Chien-Hsing Chen, Tien-Teng Shih, Chun-Kai Chen
April 2007 **ACM Transactions on Asian Language Information Processing (TALIP)**,
Volume 6 Issue 1
Publisher: ACM Press

Full text available:  pdf(1.43 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

When editors of newspapers and magazines translate proper nouns from foreign languages into Chinese, the Chinese translation (termed transliterations) they choose will typically be phonetically similar to the original word. With many different translators working without a common standard, there may be many different Chinese transliterations for the same proper noun, such as using the same sounds but different Chinese characters or even using different sounds and characters. This causes confu ...

Keywords: Chinese transliteration, Romanization, cross-lingual information retrieval, grapheme, phoneme, pinyin, similarity comparison, speech signal processing

18 Learning tool for signed English

- ◆ Eun-Jung Holden, Geoffrey G. Roy
April 1992 **Proceedings of the 1992 ACM/SIGAPP Symposium on Applied computing: technological challenges of the 1990's SAC '92**
Publisher: ACM Press

Full text available:  pdf(617.03 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

19 Multimodal architectures and frameworks: Georgia tech gesture toolkit: supporting experiments in gesture recognition

- ◆ Tracy Westeyn, Helene Brashear, Amin Atrash, Thad Starner
November 2003 **Proceedings of the 5th international conference on Multimodal interfaces ICMI '03**
Publisher: ACM Press

Full text available:  pdf(359.38 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Gesture recognition is becoming a more common interaction tool in the fields of ubiquitous and wearable computing. Designing a system to perform gesture recognition, however, can be a cumbersome task. Hidden Markov models (HMMs), a pattern recognition technique commonly used in speech recognition, can be used for recognizing certain classes of gestures. Existing HMM toolkits for speech recognition can be adapted to perform gesture recognition, but doing so requires significant knowledge of the s ...

Keywords: american sign language, context recognition, gesture recognition, hidden Markov models, interfaces, toolkit, wearable computers

20 Learning style translation for the lines of a drawing

- ◆ William T. Freeman, Joshua B. Tenenbaum, Egon C. Pasztor
January 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 1
Publisher: ACM Press

Full text available:  pdf(373.30 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present an example-based method for translating line drawings into different styles. We fit each line as a linear combination of similar lines in a training set, and interpolate between the corresponding training examples in the output style. The synthesized lines preserve the desired stylistic features of the output style.

Keywords: Style, drawings, lines, style translation

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